

REMARKS

Favorable reconsideration of this application in view of the remarks to follow is respectfully requested. Since the present Response raises no new issues, entry thereof is respectfully requested under the provisions of 37 C.F.R. §1.116.

In the present Office Action, Claims 1-22, 25-36, 40, and 48-49 stand rejected under 35 U.S.C. §103 as allegedly unpatentable over the combined disclosures of U.S. Patent No. 6,090,689 to Sadana, et al. ("Sadana '689"), U.S. Patent No. 5,534,446 to Tachimori, et al. ("Tachimori, et al.") and U.S. Patent No. 5,930,643 to Sadana, et al. ("Sadana '643").

Applicants submit that they have unexpectedly determined that the use of an ambient gas comprising 0 to about 90% oxygen and from about 10 to about 100% of N₂ or a high mobility gas selected from the group consisting of He, Kr, H₂ and mixtures is capable of providing an SOI substrate that contains a superfacial Si-containing layer that has a *substantial reduced number of tile or divot defects* as compared to SOI substrates that are not annealed in either of the claimed gas ambients. The reduced tiles and surface divots are not formed using conventional oxidizing ambients which include oxygen or a mixture of oxygen and Ar.

Applicants respectfully submit that the prior art references do not render the claimed methods obvious since none of the applied references teaches or suggests that an SOI substrate including a superfacial Si-containing surface having a reduced number of defects and divots can be achieved by choosing the appropriate gas ambient.

Sadana '689 is defective since the applied reference does not teach or suggest a method which includes an annealing step that uses the claimed gas ambients, which

applicants have unexpectedly determined provide an SOI material that has a surface Si-containing layer that has a reduced number of tile or divot defects. In contrast, Sadana '689 recites that annealing is conducted in an oxidizing ambient. No specific oxidizing ambients are provided in the '689 patent therefore the choice of the annealing ambient employed therein appears to be inconsequential provided that it be capable of forming a buried oxide region in the implanted substrate. As stated above, applicants have unexpectedly determined that the use of an ambient gas comprising 0 to about 90% oxygen and from about 10 to about 100% of N₂ or a high mobility gas selected from the group consisting of He, Kr, H₂ and mixtures therefore is capable of providing an SOI substrate that contains a superficial Si-containing layer that has a substantial reduced number of tile or divot defects as compared to SOI substrates fabricated by annealing in an oxygen ambient or oxygen admixed with Ar.

Tachimori, et al. do not alleviate the above defects in Sadana '689 since the applied secondary reference discloses that similar results, in terms of reduction of defects in the **buried oxide layer**, can be achieved using annealing ambients such as oxygen or a mixture of oxygen and Ar, He or nitrogen. The fact that the ambients disclosed in Tachimori, et al. are capable of reducing defects in the **buried oxide region**, does not necessarily mean that the same ambients can be used to improve the surface quality of the Si-containing layer that lays above the buried oxide layer. Indeed, applicants have determined which ambients can be used to provide an SOI substrate having a superficial Si-containing layer having a reduced number of tile and divot defects.

Applicants respectfully submit that in the disclosure of Tachimori, et al. there is provided many different types of annealing ambients that can be used in forming a

substantially defect free buried oxide layer. The applied reference however does not provide any guidance as to which of the annealing ambients may be used for improving the quality of the top Si-containing layer of the SOI substrate. Thus, it would be necessary for one to try the various annealing ambients disclosed in Tachimori, et al. and to determine from that trial which of the various annealing ambients and conditions would perform best for improving the quality of the top Si-containing layer. Hence, in applying the disclosure of Tachimori, et al. the Examiner appears to be trying to invoke the application of an "obvious to try" standard which is improper at law.

This standard, as apposite to the present case, has been articulated as follows:

The admonition that "obvious to try" is not the standard under §103 has been directed mainly at two kinds of errors. In some cases, what would have been "obvious to try" would have been to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful. (citations omitted; emphasis supplied). In re O'Farrel, 853, F2d. 894, 903, 7 USPQ 2d 1763, 1681 (Fed. Cir. 1988).

In examining the present rejection in view of the foregoing case law, it becomes clear that the disclosure of Tachimori, et al. provides absolutely "no direction as to which of many possible choices is likely to be successful" in forming a top Si-containing layer of an SOI material that contains a substantial reduced number of tile and/or divot defects. Indeed, the applied reference is not concerned with providing a high quality top Si-containing layer, but instead its main focus is providing an SOI material that has a high quality buried oxide region. There is absolutely no correlation provided in the disclosure of Tachimori, et al. that process conditions employed in forming a high quality buried oxide region can be used in forming a high quality top Si-containing layer.

Sadana '643 also does not alleviate the above defects in Sadana '689 since the applied reference also discloses that oxygen alone, or oxygen admixed with any inert gas can be employed in producing the SOI substrate. As such, the '643 patent does not differentiate which gas ambients could be employed to provide an SOI substrate having a superficial Si-containing layer having a reduced number of tile and divots defects.

Based on the above amendments and remarks the rejections to the claims under 35 U.S.C. §103 have been obviated; therefore reconsideration and withdrawal of the instant rejections is respectfully requested.

Thus, in view of the foregoing amendments and remarks, it is firmly believed that the present case is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,



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